REMARKS

Claims 1-17 are all the claims pending in the application. Reconsideration and allowance of all the claims are respectfully requested in view of the following remarks.

Claim Rejections - 35 U.S.C. §112

The Examiner rejected claims 2 and 3 under §112, 2nd paragraph, as indefinite. Specifically, the Examiner asserted that it is unclear whether the claim 2 recitation of "said first portion comprises a formed film" is the same as that set forth in claim 1. Accordingly, Applicants have amended claim 2 so as to make it clear that the recitation refers back to the same recitation of claim 1. Applicants have amended claim 4 in a similar manner. The amendments to claims 2 and 4 were made merely to more accurately claim the present invention, do not narrow the literal scope of the claims, and thus do not implicate an estoppel in the application of the doctrine of equivalents.

Claim Rejections - 35 U.S.C. §103

The Examiner rejected claims 1, 2, 4, 6, 10, 13, and 17, under §103(a) as being unpatentable over US Patent 5,630,668 to Ikezawa et al. (hereinafter Ikezawa) in view of FR 2 633 679 (hereinafter FR '679). Applicants respectfully traverse this rejection because the references fail to teach or suggest all of the elements as set forth in the claims.

Claims 1, 6, and 13, independently set forth a surface roughness of 0.1 μm or less in terms of Ra. As set forth in the present specification, when the surface roughness Ra is more than 0.1 μm, an abrasion of a coating layer is enhanced, and the surface receives damage. See, for example, page 34, line 15 to page 35, line 5. According to the presently claimed invention, when the surface roughness is 0.1 μm Ra or less, projections formed on the surface receive a head portion cutting function, and the surface gradually becomes a smooth surface.

The Examiner acknowledges that Ikezawa fails to disclose this feature, and thus relies on FR '679 as teaching it.[1] The Examiner cites the FR '679 abstract in support of his assertion.

[1] Office Action at page 3, lines 5-14.

However, the Examiner's interpretation of FR '679 is mistaken. FR '679 sets forth that the surface roughness of the portions of a split race that contact one another lies between 0.2 and 0.5 microns Ra; this range lies completely outside of that set forth in the claims, i.e. 0.1 μm or less. In fact, nowhere in FR '679 does the reference describe a surface roughness of 0.1 μm or less in terms of Ra. For the Examiner's convenience, a complete English translation of FR '679 is submitted herewith. Accordingly, for the sake of argument alone, even assuming that one of ordinary skill in the art were motivated to combine Ikezawa with FR '679 as suggested by the Examiner, any such combination would still not teach or suggest a surface roughness of 0.1 μm or less in terms of Ra.

For at least any of the above reasons, Ikezawa and FR '679 fail to render obvious Applicants' claims 1, 6, and 13. Likewise, these references fail to render obvious dependent claims 2, 4, 10, and 17.

Allowable Subject Matter

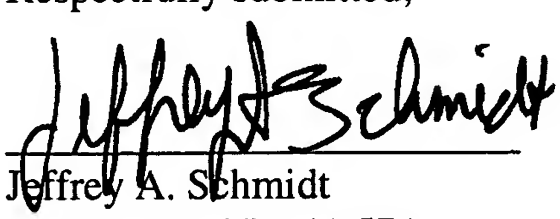
Applicants thank the Examiner for indicating that claims 3, 5, 7-9, 11, 12, and 14-16, would be allowable if rewritten in independent form. However, because of the belief that the independent claims are allowable as written, Applicants have not rewritten these claims in independent form.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Jeffrey A. Schmidt
Registration No. 41,574

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: November 12, 2004

19. FRENCH REPUBLIC

NATIONAL INSTITUTE
OF INDUSTRIAL PROPERTY

PARIS

11. **Publication No.:** ***2 633 679***
(to be used when ordering reproductions)

12. **National Registration No.:** **88 08914**

51. **Int Cl[6]: F 16 C 33/60, 33/64; F 16 B 11/00**

12. APPLICATION FOR PATENT A1

22. **Date of filing:** July 1, 1988

30. **Priority:**

43. **Date application made available to the public:** "Patents" BOPI No. 1 of January 5, 1990

60. **References to other related national documents:**

71. **Applicant(s):** *S.N.R. ROULEMENTS – FR*

72. **Inventor(s):** Dominique Letort; André Jeyr

73. **Holder(s):**

74. **Attorney(s):** Michel Ernst-Schonberg.
Régie Nationale des Usines Renault

54. Rolling-contact bearing including at least one split race and an assembly linkage

57. Rolling-contact bearing of the type including at least one split race and an assembly linkage, characterized in that the linkage consists of a film of adhesive which is less than 60 microns located between those parts of the race in contact with the ground surfaces whose roughness Ra lies between 0.2 and 0.5 microns.

[see source for figure]

FR 2 633 679 – A1

Rolling-contact bearing having at least one split race and an assembly linkage.

The invention concerns a rolling-contact bearing having at least one split race and an assembly linkage.

On this type of rolling-contact bearing, an assembly race of elastic material is usually fitted in the hole of the two inner races and/or on the outer diameter of the two outer races and allows them to be linked during transport and handling operations before assembly. This assembly race is generally driven out during assembly when the inner races are fitted onto a shaft or outer races in a hole. During dismantling of the bearing, when maintenance is performed, the two inner races are separated. This results in a risk of a mix-up of parts as well as a possibility of pollution of the internal parts of the bearing.

The use of elastic clips can also require additional machining operations with no relation to the good functioning of the bearing.

The dimensional differentiation of the bearings also requires the series production of assembly parts, as well as quantitative management and recycling measures.

The purpose of the invention is to remedy these disadvantages. Its purpose, therefore, is a linkage of the inner and/or outer races that is integral with the bearing in order to make the members of the bearing inseparable during transport, handling, assembly and dismantling operations, that is, throughout the life of the bearing.

An additional purpose of the invention is also a fusible linkage of the inner and/or outer races particularly under the effect of stresses caused by impacts or shocks, so that bearings unsuitable for use can be visually detected.

According to the invention, the linkage is composed of a film of adhesive that is less than 60 microns thick located between the two parts of the race in contact with the ground surfaces whose roughness Ra lies between 0.2 and 0.5 micron. In a bearing thus assembled the linkage of the elements of the race can

be ensured for stresses that may occur during transport, handling or extraction of the bearing. The linkage advantageously uses anaerobic, cyanoacrylate or instant adhesives, known for their mechanical characteristics:

- tensile strength up to 45 N/mm^2
- normal operating temperature: –55° to +125°C
- shock resistance up to 3.5 N/mm^2
- shearing strength up to 25 N/mm^2

Other features and advantages of the invention will appear from the [following] description, with reference to the attached drawing in which figures 1 to 10 are diagrammatic representations of bearings showing various arrangements of races and roller bodies that use an adhesive linkage between two parts of the same race.

Figure 10 is a diagrammatic representation of the process of assembling a rolling-contact bearing race as illustrated in figures 3, 7.

The bearing represented in figure 1 is a bearing with a single row of balls (1) arranged between one outer race (2) and an inner race (3) in two parts (3a, 3b), joined by an adhesive linkage.

According to figure 2, the inner race (4) is attached to an adhered plate (5) forming a shoulder of the row of rollers (6).

According to figure 3, two rows of balls in oblique contact (7, 7') are arranged between the outer race (8) and an inner race (9) in two parts (9a, 9b).

According to figures 4 and 5, two bearings (10, 11, 12 and 13) with a single row of rolling bodies are connected by an adhesive linkage in order to constitute a bearing composed of two inner and outer races adhered along one of their sides.

Figures 6 and 7 describe two bearings with two rows of rolling bodies the inner races (14, 15) of which are in two parts (14a, 14b), and (15a, 15b) using an adhesive linkage.

Figures 8 and 9 describe bearings the races of which are separated by spacers (16, 17, 18, 19) providing the adhesive assembly linkage between the outer and inner races of the bearings.

Figure 10 illustrates the process of assembling two parts of a race such as the race (9) of figure 3. The film of adhesive is deposited on the lateral face of an element (9a) of the race placed in an environment in which the temperature and relative humidity range remain appreciably constant.

The previously ground surface has a roughness Ra of between 0.2 and 0.5 micron and a cleanness of between 50 and 100 mg/m^2.

The adhesive is deposited by one of the known processes such as serigraphy, spreader, the adhesive-applying roll or pad including, if applicable, a polymerization activator. A film of adhesive of calibrated thickness, which is between 0 and 60 microns and is such that it can fill the voids between rough places of the contact surfaces.

Contact pressure is applied to the races previously positioned by means of centering pins (20). This pressure is maintained for about 10 seconds, depending on the adhesive used. The usual pressures vary between 1 N/cm^2 to 1500 N/cm^2, depending on the type of adhesive.

CLAIMS

1. Rolling-contact bearing of the type including at least one split race and an assembly linkage, characterized in that the linkage consists of a film of adhesive which is less than 60 microns located between those parts of the race in contact with the ground surfaces whose roughness Ra lies between 0.2 and 0.5 micron.

2. Method of producing the linkage according to claim 1, characterized by the fact that the film of adhesive deposited on a part is subjected, if applicable, to the action of a polymerization activator prior to application by the other part of the adhering pressure under conditions of temperature and hygrometry that are appreciably constant.